



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,465	09/22/2006	Frederic Guernalec	475.020	2038
90948	7590	02/28/2011		
Charles Muscrlain				
317 Bliss Lane				
Valley Cottage, NY 10989				
EXAMINER				
IPPOLITO RAUSCH, NICOLE				
ART UNIT		PAPER NUMBER		
2881				
MAIL DATE		DELIVERY MODE		
02/28/2011		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/587,465

Applicant(s)

GUERNALEC ET AL.

Examiner

NICOLE IPPOLITO RAUSCH

Art Unit

2881

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 6/5/2007, 9/19/2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in France on 1/31/2005. It is noted, however, that applicant has not filed a certified copy of the French application as required by 35 U.S.C. 119(b).

Information Disclosure Statement

2. The information disclosure statements filed 9/19/2006 and 6/5/2007 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. Specifically, the EP 1288329 document lacks even an English abstract. The documents have been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 8 recites the limitation "the number of passes" in line 6. There is insufficient antecedent basis for this limitation in the claim. There has hereto been no claim that requires this to be a scanning (i.e., 'passing' beam).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-7, 9-10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishihashi et al. (U.S. Patent Application Publication Number 20020066872, from hereinafter "Nishihashi") in view of Migeon et al. (U.S. Patent Application Publication Number 20060011865, from hereinafter "Migeon").

In regards to claim 1, Nishihashi teaches an apparatus for implanting ions ion an element comprising a source for delivering ions accelerated by an extraction voltage (paragraphs 0013, 0028-0029, 0051-0057, etc.), and a first adjusting means for adjusting an initial beam of ions emitted by said source into an implantation beam wherein said source is an electron cyclotron source (paragraph 0031) producing multi-

energy ions that are implanted (paragraphs 0031-0035, 00510058, 0070-0072, etc.) at a cooled temperature (paragraphs 0045, 0050, 0076. etc), the implantation of the multi-energy ions from the implantation beam being effected simultaneously at a depth controlled by the extraction voltage source (paragraphs 0031-0038).

In regards to claim 1, Nishihashi fails to explicitly teach that the element is maintained at a temperature below 120 degrees C-rather, Nishihashi just teaches that the chamber with the element is temperature controlled. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made, for it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. See *in re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In this instance, the temperature the chamber is cooled to would be dependent on the material of the element to be implanted. As Nishihashi discusses, it is desirable to prevent warping, and a material with a lower melting point would need to be maintained at a lower temperature to prevent said warping.

In regards to claim 1, Nishihashi fails to teach that the implantation medium is an aluminum alloy.

Migeon teaches that the implantation medium is an aluminum alloy (paragraph 0147).

In view of the teaching of Migeon it would have been obvious to one of ordinary skill in the art at the time the invention was made that the implantation medium is an aluminum alloy. It would be obvious to use whatever material is required for the final

product. Though for semiconductors, a glass substrate is often used, or a silicon one, it would be obvious to use aluminum if the specific application required it.

8. In regards to claim 2, Nishihashi teaches a second adjusting means for adjusting the relative position of the element and the ion source (FIGS. 1, 6-9, etc., holder 18, paragraph 0030, the holder can move, also the beam is a scanning beam, paragraphs 0030, 0038, etc.).

9. In regards to claim 3, Nishihashi teaches that the second adjusting means comprises an element holder movable so as to displace the element during its treatment (FIGS. 1, 6-9, etc., holder 18, paragraph 0030, the holder can move).

10. In regards to claim 4, Nishihashi teaches that the element holder is equipped with cooling means to evacuate the heat generated in the element during the implantation of the multi-energy ions (paragraphs 0045, 0050 and 0076).

11. In regards to claim 5, Nishihashi as modified by Migeon as discussed above fails to teach that the first adjusting means for adjusting the ion beam comprises a mass spectrometer for sorting the ions produced by the source according to their charge and mass.

However Migeon does teach that the first adjusting means for adjusting the ion beam comprises a mass spectrometer for sorting the ions produced by the source according to their charge and mass (paragraphs 0034, 0057, claim 17, etc.).

In view of this further teaching of Migeon it would have been obvious to one of ordinary skill in the art at the time the invention was made that the first adjusting means for adjusting the ion beam comprises a mass spectrometer for sorting the ions produced

by the source according to their charge and mass. So doing allows for ions of a specific energy to be implanted together, which should, in principle, lead to less variation in the finished aluminum substrate, which is highly desirable.

12. In regards to claim 6, Nishihashi does teach that the adjusting means for adjusting the initial ion beam further comprises optical focusing means (see, i.e., abstract), a current transformer (paragraph 0050) and a shutter (paragraph 0042). However, Nishihashi as modified by Migeon as discussed above fails to teach a profiler.

Migeon does teach a profiler (paragraphs 0049, 0088, 0099, etc.).

In view of this further teaching of Migeon it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a profiler. So doing lends the device to better understand the unique features of the beam, and allows for implantation to take place with a greater degree of accuracy, which is highly desirable.

13. In regards to claim 7, Nishihashi teaches an enclosure equipped with a vacuum pump (paragraphs 0029, 0034, etc.).

14. In regards to claim 9, Nishihashi teaches that the multi-energy ion beam displaces relatively with respect to the element at a constant rate (paragraphs 0005, 0030, 0038, 0044, etc. all teach scanning, which can be at a constant rate. Paragraph 0044 teaches that the speed may be adjusted, which means it is not necessary to do so).

15. In regards to claim 10, Nishihashi teaches that the multi-energy beam displaces relatively with respect to the element at a variable rate that takes into account the angle of incidence of the multi-energy ion beam with respect to the surface of the element

(paragraph 0044 teaches that the speed of scanning may be adjusted, paragraphs 0040 and 0062 teaches tilting the stage, which changes the angle of incidence).

16. In regards to claim 12, Nishihashi teaches that the multi-energy ion beam is emitted at a variable emission energy controlled by the source (paragraphs 0031-0035, 00510058, 0070-0072, etc.)

17. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishihara as modified by Migeon as applied to claim 8 above, and further in view of Mitchell et al. (U.S. Patent Number 6646276, from hereinafter "Mitchell").

In regards to claim 8, Nishihara as modified by Migeon fails to teach that adjusting the relative positions of the element and the ion source comprises calculating means for calculating said position on the basis of data related to the nature of the ion beam, the geometry of the part, the rate of displacement of the part holder with respect to the source, and the number of passes completed.

Mitchell teaches that adjusting the relative positions of the element and the ion source comprises calculating means for calculating said position on the basis of data related to the nature of the ion beam, the geometry of the part, the rate of displacement of the part holder with respect to the source, and the number of passes completed (column 10 lines 11-59).

In view of the teaching of Mitchell it would have been obvious to one of ordinary skill in the art at the time the invention was made that adjusting the relative positions of the element and the ion source comprises calculating means for calculating said position on the basis of data related to the nature of the ion beam, the geometry of the

part, the rate of displacement of the part holder with respect to the source, and the number of passes completed. So doing allows for a more dynamic adjustment, so that beam aberration may be compensated for, which in turn allows for a more accurate final product to be produced.

18. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishihara as modified by Migeon as applied to claim 11 above, and further in view of Moghadam et al. (U.S. Patent Application Publication Number 20040069410, from hereinafter "Moghadam").

In regards to claim 11, Nishihara as modified by Migeon fails to teach that the multi-energy beam is emitted at a constant emission rate and constant emission energies.

Moghadam teaches that the multi-energy beam is emitted at a constant emission rate and constant emission energies (paragraph 0031).

In view of the teaching of Moghadam it would have been obvious to one of ordinary skill in the art at the time the invention was made that the multi-energy beam is emitted at a constant emission rate and constant emission energies. So doing would make a highly uniform substrate which would be obvious if it was what the application of said substrate required for industrial applications.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICOLE IPPOLITO RAUSCH whose telephone number

is (571)270-7449. The examiner can normally be reached on Monday through Thursday 6:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. I./
Examiner, Art Unit 2881

/ROBERT KIM/

Supervisory Patent Examiner, Art Unit 2881